Modified HAM for approximate solutions of systems of singular integral equations of first kind

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Abstract. In this note, modified homotopy analyses method (MHAM) together with truncated Chebyshev series are applied for system of first kind Cauchy type singular integral equation as the semi-analytical solution. MHAM reduces system of singular integral equations into iteration system of algebraic equations and singular kernel integrals are computed exactly by replacing density function with Chebyshev polynomials of the first kind. Numerical examples are provided to show the high accuracy of the proposed method. Comparisons with other methods is also presented.

Keywords: Singular integral equation, Chebyshev polynomials, Modified homotopy analyses method, Accuracy.